

APPENDIX C

SENSITIVITY ANALYSES: DATA AND RESULTS

(Data presented in this Tables C.2 through C.36 are from the 1995 Listing Background Document (USEPA, 1995a) and from RCRA CBI Documents (RCRA CBI, 1995))

Table C.1 Two High-End Parameters Determined from Sensitivity Analysis

Scenario			2-High End Parameters		Receptor Well Conc. (mg/L)
Waste stream	Location	Chemical	Parameter1	Parameter2	
Hydrorefining	On-Site	Benzene	Area	Waste Volume	2.74E-01
		Benzene (TC)	Infil	Xwell	1.52E-01
		Arsenic	Xwell	Waste Volume	2.11E-01
		Arsenic (TC)	Xwell	Waste Volume	1.93E-01
Hydrorefining	Off-Site	Benzene	Area	Waste Volume	2.92E-01
		Benzene (TC)	Area	Waste Volume	1.35E-01
		Arsenic	Ywell	Waste Volume	2.70E-01
		Arsenic (TC)	Ywell	Waste Volume	1.39E-01
Hydrotreating	On-site	Benzene	Waste Volume	Xwell	5.60E-01
		Benzene (TC)	Xwell	Infiltration	1.20E-01
		Arsenic	Waste Volume	Waste Conc.	2.30E-02
	Off-Site	Benzene	Ywell	Infiltration	3.00E-01
		Benzene (TC)	Waste Volume	Area	9.44E-02
		Arsenic	Waste Volume	Ywell	2.29E-02
HF Alkylation	On-site	Benzene	Infiltration	Xwell	3.60E-02
	Off-Site	Benzene	Area	TCLP	3.98E-02
Crude Oil Sludge	Off-Site	Benzene	Area	Waste Volume	1.71E-01
		Benzene (TC)	Area	Waste Volume	1.34E-01
Off-Spec Prod. and Fines	On-Site	Benz(a)anthracene	Xwell	Waste Volume	4.23E-04
	Off-Site	Benz(a)anthracene	Ywell	Infiltration	3.85E-04
CSO Sludge	On-site	Benzene	Xwell	Waste Volume	2.55E-02
	Off-site	Benzene	Area	Waste Volume	1.55E-02
CSO Sludge	On-site	Benzene	Waste Volume	Ywell	1.03E-02
Contingent Management	Off-site	Benzene	Area	Waste Volume	1.55E-02

Table C.2 Parameter Distributions for CSO Sludge / Benzene

Parameter	Onsite		Offsite	
	Median ¹	High-End ²	Median ¹	High-End ²
Area (m ²)	61514	121410	2020	162000
Wst. Quantity (MT)	3690	62860	3690	62860
TCLP (mg/L)	0.059	0.084	0.059	0.084
Wst Conc (mg/kg)	1.2	1.2	1.2	1.2
Infil (m/yr)	0.17	0.46	0.17	0.46
X-well (m)	430	102	430	102
Y- Well (m)	*	0	*	0
Z-Well (m)	6.5	1.3	6.5	1.3

* The median values of Y-well is taken as 1/2 the plume width and is therefore a function of X-well and landfill area.

1. Mean value in the case of waste and leachate concentration.
2. High-End refers to the 10th % for X-well, maximum value for waste and leachate concentrations and 90th % for all other parameters

Table C.3 Sensitivity Analysis CSO On-site Landfill Scenario, Benzene

Two-Parameters at High End	Area (m ²)	Wst. Vol (m ³)	TCLP (mg/L)	Wst Conc (mg/kg)	Cw / Cl (L/kg)	Wst. Den (g/cm ³)	Infil (m/yr)	X-well (m)	Y- Well (m)	Z-Well (m)	Maximum 9-year Avg. Conc. (mg/L)	Relative Conc. *	Rank
Base Case	61514	2635.71	0.059	1.2	20.34	1.4	0.17	430	111.72	6.5	3.73E-03		
Xwell & Wst Vol	61514	44900	0.059	1.2	20.339	1.4	0.17	102	97.72	6.5	1.91E-02	4.13	1
Infil & Wst. Vol	61514	44900	0.059	1.2	20.339	1.4	0.46	430	111.72	6.5	1.81E-02	3.85	2
Ywell & Wst. Vol	61514	44900	0.059	1.2	20.339	1.4	0.17	430	0.00	6.5	1.44E-02	2.87	3
Area & Wst. Vol	121410	44900	0.059	1.2	20.339	1.4	0.17	430	140.38	6.5	1.39E-02	2.72	4
TCLP & Wst. Vol	61514	44900	0.084	1.2	14.286	1.4	0.17	430	111.72	6.5	1.27E-02	2.40	5
Infil & Xwell	61514	2635.71	0.059	1.2	20.34	1.4	0.46	102	97.72	6.5	9.69E-03	1.60	6
Ywell & Xwell	61514	2635.71	0.059	1.2	20.34	1.4	0.17	102	0.00	6.5	9.68E-03	1.60	7
TCLP & xwell	61514	2635.71	0.084	1.2	14.29	1.4	0.17	102	97.72	6.5	9.34E-03	1.51	8
Xwell & Zwell	61514	2635.71	0.059	1.2	20.34	1.4	0.17	102	97.72	1.3	7.86E-03	1.11	9
Area & Xwell	121410	2635.71	0.059	1.2	20.34	1.4	0.17	102	127.63	6.5	6.70E-03	0.80	10
Ywell & TCLP	61514	2635.71	0.084	1.2	14.29	1.4	0.17	430	0.00	6.5	6.46E-03	0.73	11
Ywell & Infil	61514	2635.71	0.059	1.2	20.34	1.4	0.46	430	0.00	6.5	5.41E-03	0.45	12
Infil & TCLP	61514	2635.71	0.084	1.2	14.29	1.4	0.46	430	111.72	6.5	4.57E-03	0.23	13
Area & Ywell	121410	2635.71	0.059	1.2	20.34	1.4	0.17	430	0.00	6.5	3.92E-03	0.05	14
Wst. Vol & Zwell	61514	44900	0.059	1.2	20.34	1.4	0.17	430	111.72	1.3	3.82E-03	0.03	15
Area & TCLP	121410	2635.71	0.084	1.2	14.29	1.4	0.17	430	140.38	6.5	3.61E-03	-0.03	16
Area & Infil	121410	2635.71	0.059	1.2	20.34	1.4	0.46	430	140.38	6.5	3.18E-03	-0.15	17
Ywell & Zwell	61514	2635.71	0.059	1.2	20.34	1.4	0.17	430	0.00	1.3	2.39E-03	-0.36	18
TCLP & Zwell	61514	2635.71	0.084	1.2	14.29	1.4	0.17	430	111.72	1.3	1.74E-03	-0.53	19
Infil & Zwell	61514	2635.71	0.059	1.2	20.34	1.4	0.46	430	111.72	1.3	1.67E-03	-0.55	20
Area & Zwell	121410	2635.71	0.059	1.2	20.34	1.4	0.17	430	140.38	1.3	1.40E-03	-0.62	21

* Relative concentration is equal to (Well Conc. - Basecase Well Conc)/Basecase Well Conc.

Table C.4 Sensitivity Analysis CSO Off-site Landfill Scenario, Benzene

Two-Parameters at High End	Area (m ²)	Depth (m)	Wst. Vol (m ³)	TCLP (mg/L)	Wst Conc (mg/kg)	Cw / Cl (L/kg)	Wst. Den (g/cm ³)	Infil (m/yr)	X-well (m)	Y- Well (m)	Z-Well (m)	Maximum 9-year Avg. Conc. (mg/L)	Relative Conc. *	Rank
Base Case	2020	2.6	2635.71	0.059	1.2	20.34	1.4	0.17	430	52.84	6.5	4.78E-04		
Area & Wst. Vol	162000	2.6	44900	0.059	1.2	20.34	1.4	0.17	430	155.71	6.5	1.55E-02	31.50	1
Area & Xwell	162000	2.6	2635.71	0.059	1.2	20.34	1.4	0.17	102	143.51	6.5	5.61E-03	10.74	2
Ywell & Infil	2020	2.6	2635.71	0.059	1.2	20.34	1.4	0.46	430	0.00	6.5	4.83E-03	9.11	3
Area & Ywell	162000	2.6	2635.71	0.059	1.2	20.34	1.4	0.17	430	0.00	6.5	3.24E-03	5.77	4
Ywell & Xwell	2020	2.6	2635.71	0.059	1.2	20.34	1.4	0.17	102	0.00	6.5	3.23E-03	5.75	5
Area & TCLP	162000	2.6	2635.71	0.084	1.2	14.29	1.4	0.17	430	155.71	6.5	3.17E-03	5.64	6
Infil & Xwell	2020	2.6	2635.71	0.059	1.2	20.34	1.4	0.46	102	34.38	6.5	3.07E-03	5.42	7
Ywell & TCLP	2020	2.6	2635.71	0.084	1.2	14.29	1.4	0.17	430	0.00	6.5	2.87E-03	5.01	8
Area & Infil	162000	2.6	2635.71	0.059	1.2	20.34	1.4	0.46	430	155.71	6.5	2.61E-03	4.45	9
Ywell & Wst. Vol	2020	2.6	44900	0.059	1.2	20.34	1.4	0.17	430	0.00	6.5	2.16E-03	3.51	10
Infil & TCLP	2020	2.6	2635.71	0.084	1.2	14.29	1.4	0.46	430	52.84	6.5	1.64E-03	2.44	11
Xwell & Zwell	2020	2.6	2635.71	0.059	1.2	20.34	1.4	0.17	102	34.38	1.3	1.53E-03	2.20	12
TCLP & xwell	2020	2.6	2635.71	0.084	1.2	14.29	1.4	0.17	102	34.38	6.5	1.45E-03	2.03	13
Infil & Wst. Vol	2020	2.6	44900	0.059	1.2	20.34	1.4	0.46	430	52.84	6.5	1.34E-03	1.80	14
Area & Zwell	162000	2.6	2635.71	0.059	1.2	20.34	1.4	0.17	430	155.71	1.3	1.27E-03	1.65	15
Xwell & Wst Vol	2020	2.6	44900	0.059	1.2	20.34	1.4	0.17	102	34.38	6.5	1.08E-03	1.25	16
Ywell & Zwell	2020	2.6	2635.71	0.059	1.2	20.34	1.4	0.17	430	0.00	1.3	9.50E-04	0.99	17
TCLP & Wst. Vol	2020	2.6	44900	0.084	1.2	14.29	1.4	0.17	430	52.84	6.5	6.99E-04	0.46	18
Infil & Zwell	2020	2.6	2635.71	0.059	1.2	20.34	1.4	0.46	430	52.84	1.3	4.84E-04	0.01	19
TCLP & Zwell	2020	2.6	2635.71	0.084	1.2	14.29	1.4	0.17	430	52.84	1.3	2.77E-04	-0.42	20
Wst. Vol & Zwell	2020	2.6	44900	0.059	1.2	20.34	1.4	0.17	430	52.84	1.3	2.08E-04	-0.57	21

* Relative concentration is equal to (Well Conc. - Basecase Well Conc)/Basecase Well Conc.

Table C.5 Parameter Distributions for Contingent Mgmt. CSO Sludge/ Benzene

Parameter	Onsite		Offsite	
	Median ¹	High-End ²	Median ¹	High-End ²
Area (m ²)	24594	202350	2020	162000
Wst. Quantity (MT)	3500	62860	3500	62860
TCLP (mg/L)	0.059	0.084	0.059	0.084
Wst Conc (mg/kg)	1.2	1.2	1.2	1.2
Infil (m/yr)	0.17	0.46	0.17	0.46
X-well (m)	430	102	430	102
Y- Well (m)	*	0	*	0
Z-Well (m)	6.5	1.3	6.5	1.3

* The median values of Y-well is taken as 1/2 the plume width and is therefore a function of X-well and landfill area.

1. Mean value in the case of waste and leachate concentration.
2. High-End refers to the 10th % for X-well, maximum value for waste and leachate concentrations and 90th % for all other parameters

Table C.6 Sensitivity Analysis for Contingent Management of CSO Sludge, On-site Landfill/Benzene

Two Parameters at High End	Area (m ²)	Depth (m)	Wst. Vol (m ³)	TCLP (mg/L)	Wst Conc (mg/kg)	Cw / Cl (L/kg)	Wst. Den (g/cm ³)	Infil (m/yr)	X-well (m)	Y- Well (m)	Z-Well (m)	Maximum 9-year Avg. Conc. (mg/L)	Relative Conc. *	Rank
Base Case	24594	2.134	2500	0.059	1.2	20.34	1.4	0.17	430	85.46	6.5	2.30E-04		
Wst. Vol & Y-Well	24594	2.134	44900	0.059	1.2	20.34	1.4	0.17	430	0.00	6.5	1.03E-02	43.63	1
X-Well & Y- Well	24594	2.134	2500	0.059	1.2	20.34	1.4	0.17	102	0.00	6.5	9.96E-03	42.34	2
Y-Well & Infil	24594	2.134	2500	0.059	1.2	20.34	1.4	0.46	430	0.00	6.5	8.69E-03	36.82	3
Y-Well & TCLP	24594	2.134	2500	0.084	1.2	14.29	1.4	0.17	430	0.00	6.5	7.56E-03	31.89	4
Y-Well & Z-Well	24594	2.134	2500	0.059	1.2	20.34	1.4	0.17	430	0.00	1.3	2.57E-03	10.17	5
Y-Well & Area	202350	2.134	2500	0.059	1.2	20.34	1.4	0.17	430	0.00	6.5	2.55E-03	10.10	6
Wst. Vol & Infil	24594	2.134	44900	0.059	1.2	20.34	1.4	0.46	430	85.46	6.5	1.65E-03	6.19	7
X-Well & Infil	24594	2.134	2500	0.059	1.2	20.34	1.4	0.46	102	69.92	6.5	1.04E-03	3.52	8
TCLP & Infil	24594	2.134	2500	0.084	1.2	14.29	1.4	0.46	430	85.46	6.5	7.82E-04	2.40	9
Wst. Vol & TCLP	24594	2.134	44900	0.084	1.2	14.29	1.4	0.17	430	85.46	6.5	5.35E-04	1.33	10
Wst. Vol & X-Well	24594	2.134	44900	0.059	1.2	20.34	1.4	0.17	102	69.92	6.5	3.90E-04	0.70	11
Infil & Area	202350	2.134	2500	0.059	1.2	20.34	1.4	0.46	430	169.09	6.5	3.40E-04	0.48	12
X-Well & TCLP	24594	2.134	2500	0.084	1.2	14.29	1.4	0.17	102	69.92	6.5	2.99E-04	0.30	13
Infil & Z-Well	24594	2.134	2500	0.059	1.2	20.34	1.4	0.46	430	85.46	1.3	2.40E-04	0.05	14
X-Well & Z-Well	24594	2.134	2500	0.059	1.2	20.34	1.4	0.17	102	69.92	1.3	1.62E-04	-0.29	15
Wst. Vo & Z-Well	24594	2.134	44900	0.059	1.2	20.34	1.4	0.17	430	85.46	1.3	1.37E-04	-0.41	16
Wst. Vol & Area	202350	2.134	44900	0.059	1.2	20.34	1.4	0.17	430	169.09	6.5	1.35E-04	-0.41	17
TCLP & Z-Well	24594	2.134	2500	0.084	1.2	14.29	1.4	0.17	430	85.46	1.3	9.99E-05	-0.57	18
TCLP & Area	202350	2.134	2500	0.084	1.2	14.29	1.4	0.17	430	169.09	6.5	2.07E-05	-0.91	19
X-Well & Area	202350	2.134	2500	0.059	1.2	20.34	1.4	0.17	102	157.31	6.5	1.47E-05	-0.94	20
Area & Z-Well	202350	2.134	2500	0.059	1.2	20.34	1.4	0.17	430	169.09	1.3	6.51E-06	-0.97	21

* Relative concentration * Relative concentration is equal to (Well Conc. - Basecase Well Conc)/Basecase Well Conc.

Table C.7 Sensitivity Analysis for Contingent Management of CSO Sludge, Off-Site Landfill/Benzene

Two-Parameters at High End	Area (m ²)	Waste Qty (mt)	Wst. Vol (m ³)	TCLP (mg/L)	Wst Conc (mg/kg)	Cw / Cl (L/kg)	Wst. Den (g/cm ³)	Infil (m/yr)	X-well (m)	Y- Well (m)	Z-Well (m)	Maximum 9-year Avg. Conc. (mg/L)	Relative Conc. *	Rank Average
Base Case	2020	3500	2500	0.059	1.2	20.34	1.4	0.17	430	52.84	6.5	4.77E-04		
Wst. Vol & Area	162000	62860	44900	0.059	1.2	20.34	1.4	0.17	430	155.71	6.5	1.55E-02	31.60	1
X-Well & Area	162000	3500	2500	0.059	1.2	20.34	1.4	0.17	102	143.51	6.5	5.34E-03	10.19	2
Y-Well & Infil	2020	3500	2500	0.059	1.2	20.34	1.4	0.46	430	0.00	6.5	4.81E-03	9.09	3
X-Well & Y- Well	2020	3500	2500	0.059	1.2	20.34	1.4	0.17	102	0.00	6.5	3.22E-03	5.76	4
Y-Well & Area	162000	3500	2500	0.059	1.2	20.34	1.4	0.17	430	0.00	6.5	3.08E-03	5.46	5
X-Well & Infil	2020	3500	2500	0.059	1.2	20.34	1.4	0.46	102	34.38	6.5	3.05E-03	5.39	6
TCLP & Area	162000	3500	2500	0.084	1.2	14.29	1.4	0.17	430	155.71	6.5	3.02E-03	5.33	7
Y-Well & TCLP	2020	3500	2500	0.084	1.2	14.29	1.4	0.17	430	0.00	6.5	2.86E-03	5.00	8
Infil & Area	162000	3500	2500	0.059	1.2	20.34	1.4	0.46	430	155.71	6.5	2.47E-03	4.18	9
Wst. Vol & Y- Well	2020	62860	44900	0.059	1.2	20.34	1.4	0.17	430	0.00	6.5	2.16E-03	3.52	10
TCLP & Infil	2020	3500	2500	0.084	1.2	14.29	1.4	0.46	430	52.84	6.5	1.63E-03	2.42	11
X-Well & Z-Well	2020	3500	2500	0.059	1.2	20.34	1.4	0.17	102	34.38	1.3	1.53E-03	2.21	12
X-Well & TCLP	2020	3500	2500	0.084	1.2	14.29	1.4	0.17	102	34.38	6.5	1.44E-03	2.03	13
Wst. Vol & Infil	2020	62860	44900	0.059	1.2	20.34	1.4	0.46	430	52.84	6.5	1.34E-03	1.81	14
Area & Z-Well	162000	3500	2500	0.059	1.2	20.34	1.4	0.17	430	155.71	1.3	1.21E-03	1.53	15
Wst. Vol & X-Well	2020	62860	44900	0.059	1.2	20.34	1.4	0.17	102	34.38	6.5	1.08E-03	1.26	16
Y-Well & Z-Well	2020	3500	2500	0.059	1.2	20.34	1.4	0.17	430	0.00	1.3	9.47E-04	0.99	17
Wst. Vol & TCLP	2020	62860	44900	0.084	1.2	14.29	1.4	0.17	430	52.84	6.5	6.99E-04	0.47	18
Infil & Z-Well	2020	3500	2500	0.059	1.2	20.34	1.4	0.46	430	52.84	1.3	4.81E-04	0.01	19
TCLP & Z-Well	2020	3500	2500	0.084	1.2	14.29	1.4	0.17	430	52.84	1.3	2.75E-04	-0.42	20
Wst. Vol. & Z-Well	2020	62860	44900	0.059	1.2	20.34	1.4	0.17	430	52.84	1.3	2.08E-04	-0.56	21

* Relative concentration is equal to (Well Conc. - Basecase Well Conc)/Basecase Well Conc.

Table C.8 Parameter Distributions for Crude Oil Tank Sludge / Benzene

Parameter	Onsite		Offsite	
	Median ¹	High-End ²	Median ¹	High-End ²
Area (m ²)	NA	NA	2020	162000
Wst. Quantity (MT)	NA	NA	595	12640
TCLP (mg/L)	NA	NA	0.679	1.7
Wst Conc (mg/kg)	NA	NA	58.72	220
Infil (m/yr)	NA	NA	0.17	0.46
X-well (m)	NA	NA	430	102
Y- Well (m)	NA	NA	*	0
Z-Well (m)	NA	NA	6.5	1.3

* The median values of Y-well is taken as 1/2 the plume width and is therefore a function of X-well and landfill area.

1. Mean value in the case of waste and leachate concentration.
2. High-End refers to the 10th % for X-well, maximum value for waste and leachate concentrations and 90th % for all other parameters
3. Note : On-site management scenario for Crude Oil Tank Sludge was not considered for modeling analysis.

Table C.9 Sensitivity Analysis for Crude Oil Tank sludge Off-Site Landfill /Benzene

Two-Parameters at High End	Area (m ²)	Depth (m)	Wst. Vol (m ³)	TCLP (mg/L)	Wst Conc (mg/kg)	Cw / Cl (L/kg)	Wst. Den (g/cm ³)	Infil (m/yr)	X-well (m)	Y- Well (m)	Z-Well (m)	Maximum 9-year Avg. Conc. (mg/L)	Relative Conc. *	Rank
Base Case	2020	2.6	391.447	0.679	58.72	86.48	1.52	0.17	430	52.84	6.5	5.12E-03		
Area & Wst. Vol	162000	2.6	8315.79	0.679	58.72	86.48	1.52	0.17	430	155.71	6.5	1.71E-01	32.32	1
Area & Wst. Conc	162000	2.6	391.447	0.679	220	324.01	1.52	0.17	430	155.71	6.5	8.02E-02	14.67	2
Infil & Wst. Vol	2020	2.6	8315.79	0.679	58.72	86.48	1.52	0.46	430	52.84	6.5	5.85E-02	10.42	3
Ywell & Infil	2020	2.6	391.447	0.679	58.72	86.48	1.52	0.46	430	0.00	6.5	5.24E-02	9.23	4
Area & Xwell	162000	2.6	391.447	0.679	58.72	86.48	1.52	0.17	102	143.51	6.5	5.18E-02	9.12	5
Ywell & TCLP	2020	2.6	391.447	1.7	58.72	34.54	1.52	0.17	430	0.00	6.5	5.11E-02	8.98	6
Ywell & Xwell	2020	2.6	391.447	0.679	58.72	86.48	1.52	0.17	102	0.00	6.5	3.44E-02	5.72	7
Infil & Xwell	2020	2.6	391.447	0.679	58.72	86.48	1.52	0.46	102	34.38	6.5	3.32E-02	5.49	8
Area & Ywell	162000	2.6	391.447	0.679	58.72	86.48	1.52	0.17	430	0.00	6.5	3.00E-02	4.86	9
Area & TCLP	162000	2.6	391.447	1.7	58.72	34.54	1.52	0.17	430	155.71	6.5	2.85E-02	4.57	10
Infil & TCLP	2020	2.6	391.447	1.7	58.72	34.54	1.52	0.46	430	52.84	6.5	2.71E-02	4.28	11
TCLP & xwell	2020	2.6	391.447	1.7	58.72	34.54	1.52	0.17	102	34.38	6.5	2.59E-02	4.05	12
Area & Infil	162000	2.6	391.447	0.679	58.72	86.48	1.52	0.46	430	155.71	6.5	2.44E-02	3.76	13
Ywell & Wst. Vol	2020	2.6	8315.79	0.679	58.72	86.48	1.52	0.17	430	0.00	6.5	2.40E-02	3.70	14
Ywell & Wst Conc	2020	2.6	391.447	0.679	220	324.01	1.52	0.17	430	0.00	6.5	2.33E-02	3.55	15
Xwell & Zwell	2020	2.6	391.447	0.679	58.72	86.48	1.52	0.17	102	34.38	1.3	1.64E-02	2.20	16
Infil & Wst. Conc	2020	2.6	391.447	0.679	220	324.01	1.52	0.46	430	52.84	6.5	1.44E-02	1.82	17
TCLP & Wst Conc	2020	2.6	391.447	1.7	220	129.41	1.52	0.17	430	52.84	6.5	1.34E-02	1.62	18
TCLP & Wst. Vol	2020	2.6	8315.79	1.7	58.72	34.54	1.52	0.17	430	52.84	6.5	1.30E-02	1.54	19
Xwell & Wst Vol	2020	2.6	8315.79	0.679	58.72	86.48	1.52	0.17	102	34.38	6.5	1.20E-02	1.35	20
Area & Zwell	162000	2.6	391.447	0.679	58.72	86.48	1.52	0.17	430	155.71	1.3	1.17E-02	1.29	21
Xwell & Wst. Conc	2020	2.6	391.447	0.679	220	324.01	1.52	0.17	102	34.38	6.5	1.16E-02	1.27	22
Ywell & Zwell	2020	2.6	391.447	0.679	58.72	86.48	1.52	0.17	430	0.00	1.3	1.02E-02	0.99	23
Wst. Vol & Wst. Conc	2020	2.6	8315.79	0.679	220	324.01	1.52	0.17	430	52.84	6.5	5.95E-03	0.16	24
Infil & Zwell	2020	2.6	391.447	0.679	58.72	86.48	1.52	0.46	430	52.84	1.3	5.24E-03	0.02	25
TCLP & Zwell	2020	2.6	391.447	1.7	58.72	34.54	1.52	0.17	430	52.84	1.3	4.91E-03	-0.04	26
Wst. Vol & Zwell	2020	2.6	8315.79	0.679	58.72	86.48	1.52	0.17	430	52.84	1.3	2.31E-03	-0.55	27
Wst Conc & Zwell	2020	2.6	391.447	0.679	220	324.01	1.52	0.17	430	52.84	1.3	2.22E-03	-0.57	28

* Relative concentration is equal to (Well Conc. - Basecase Well Conc)/Basecase Well Conc.

Table C.10 Sensitivity Analysis for Crude Oil Tank sludge Off-Site Landfill /TC Capped Benzene

Area (m2)	Depth (m)	Wst. Vol (m3)	TCLP (mg/L)	Wst Conc (mg/kg)	Cw / Cl (L/kg)	Wst. Den (g/cm3)	Infil (m/yr)	X-well (m)	Y- Well (m)	Z-Well (m)	Maximum 9-year Avg. Conc. (mg/L)	Relative Conc. *	Rank Average
2020	2.6	391.4	0.5	58.72	117.44	1.52	0.17	430	52.84	6.5	3.94E-03		
162000	2.6	8315.8	0.5	58.72	117.44	1.52	0.17	430	155.71	6.5	1.34E-01	33.15	1
162000	2.6	391.4	0.5	220	440.00	1.52	0.17	430	155.71	6.5	7.14E-02	17.13	2
162000	2.6	391.4	0.5	58.72	117.44	1.52	0.17	102	143.51	6.5	4.94E-02	11.54	3
2020	2.6	391.4	0.5	58.72	117.44	1.52	0.46	430	0.00	6.5	4.04E-02	9.26	4
162000	2.6	391.4	0.5	58.72	117.44	1.52	0.17	430	0.00	6.5	2.92E-02	6.41	5
2020	2.6	391.4	0.5	58.72	117.44	1.52	0.17	102	0.00	6.5	2.67E-02	5.78	7
2020	2.6	391.4	0.5	58.72	117.44	1.52	0.46	102	34.38	6.5	2.56E-02	5.50	8
162000	2.6	391.4	0.5	58.72	117.44	1.52	0.46	430	155.71	6.5	2.41E-02	5.13	9
2020	2.6	8315.8	0.5	58.72	117.44	1.52	0.17	430	0.00	6.5	1.81E-02	3.60	10
2020	2.6	391.4	0.5	220	440.00	1.52	0.17	430	0.00	6.5	1.74E-02	3.41	11
2020	2.6	391.4	0.5	58.72	117.44	1.52	0.17	102	34.38	1.3	1.27E-02	2.22	13
162000	2.6	391.4	0.5	58.72	117.44	1.52	0.17	430	155.71	1.3	1.14E-02	1.89	14
2020	2.6	391.4	0.5	220	440.00	1.52	0.46	430	52.84	6.5	1.07E-02	1.73	15
2020	2.6	8315.8	0.5	58.72	117.44	1.52	0.46	430	52.84	6.5	1.06E-02	1.69	16
2020	2.6	8315.8	0.5	58.72	117.44	1.52	0.17	102	34.38	6.5	9.07E-03	1.30	18
2020	2.6	391.4	0.5	220	440.00	1.52	0.17	102	34.38	6.5	8.65E-03	1.20	19
2020	2.6	391.4	0.5	58.72	117.44	1.52	0.17	430	0.00	1.3	7.81E-03	0.99	21
2020	2.6	8315.8	0.5	220	440.00	1.52	0.17	430	52.84	6.5	4.41E-03	0.12	22
2020	2.6	391.4	0.5	58.72	117.44	1.52	0.46	430	52.84	1.3	4.04E-03	0.03	24
2020	2.6	8315.8	0.5	58.72	117.44	1.52	0.17	430	52.84	1.3	1.74E-03	-0.56	26
2020	2.6	391.4	0.5	220	440.00	1.52	0.17	430	52.84	1.3	1.67E-03	-0.58	27

* is equal to (Well Conc. - Basecase Well Conc)/Basecase Well Conc.

Table C.11 Parameter Distributions for Hydrotreating Catalyst / Benzene

Parameter	Onsite		Offsite	
	Median ¹	High-End ²	Median ¹	High-End ²
Area (m ²)	29865	121406	2020	162000
Wst. Quantity (MT)	400	1843	400	1843
TCLP (mg/L)	7.9	39	7.9	39
Wst Conc (mg/kg)	116.38	500	116.38	500
Infil (m/yr)	0.17	0.46	0.17	0.46
X-well (m)	430	102	430	102
Y- Well (m)	*	0	*	0
Z-Well (m)	6.5	1.3	6.5	1.3

* The median values of Y-well is taken as 1/2 the plume width and is therefore a function of X-well and landfill area.

1. Mean value in the case of waste and leachate concentration.
2. High-End refers to the 10th % for X-well, maximum value for waste and leachate concentrations and 90th % for all other parameters

Table C.12 Sensitivity Analysis Hydrotreating On-site Landfill Scenario/ Benzene

Two Parameters at High End	Area (m ²)	Wst. Vol (m ³)	TCLP (mg/L)	Wst Conc (mg/kg)	Cw / Cl (L/kg)	Wst. Den (g/cm ³)	Infil (m/yr)	X-well (m)	Y- Well (m)	Z-Well (m)	Maximum 9-year Avg. Conc. (mg/L)	Relative Conc. *	Rank
Base Case	29865	476	7.9	116.38	14.73	0.84	0.17	430	90.08	6.5	5.59E-02		
Wst. Conc. & X-Well	29865	476	7.9	500	63.29	0.84	0.17	102	74.85	6.5	5.13E-01	8.18	1
Wst. Vol & X-Well	29865	1842.85	7.9	116.38	14.73	0.84	0.17	102	74.85	6.5	4.76E-01	7.53	2
Wst. Conc. & Y- Well	29865	476	7.9	500	63.29	0.84	0.17	430	0.00	6.5	4.33E-01	6.75	3
Wst. Vol & Wst Conc	29865	1842.85	7.9	500	63.29	0.84	0.17	430	90.08	6.5	4.05E-01	6.25	4
Wst. Vol & Y- Well	29865	1842.85	7.9	116.38	14.73	0.84	0.17	430	0.00	6.5	4.01E-01	6.18	5
Wst. Conc & Infil	29865	476	7.9	500	63.29	0.84	0.46	430	90.08	6.5	2.82E-01	4.04	6
Wst. Vol & Infil	29865	1842.85	7.9	116.38	14.73	0.84	0.46	430	90.08	6.5	2.56E-01	3.59	7
Wst. Conc & TCLP	29865	476	39	500	12.82	0.84	0.17	430	90.08	6.5	2.42E-01	3.33	8
X-Well & Y- Well	29865	476	7.9	116.38	14.73	0.84	0.17	102	0.00	6.5	2.19E-01	2.91	9
Wst. Vol & TCLP	29865	1842.85	39	116.38	2.98	0.84	0.17	430	90.08	6.5	2.18E-01	2.90	10
X-Well & Infil	29865	476	7.9	116.38	14.73	0.84	0.46	102	74.85	6.5	1.86E-01	2.33	11
Wst. Conc & Area	121406	476	7.9	500	63.29	0.84	0.17	430	140.38	6.5	1.86E-01	2.32	12
Wst. Vol & Area	121406	1842.85	7.9	116.38	14.73	0.84	0.17	430	140.38	6.5	1.68E-01	2.00	13
X-Well & Z-Well	29865	476	7.9	116.38	14.73	0.84	0.17	102	74.85	1.3	1.64E-01	1.94	14
X-Well & TCLP	29865	476	39	116.38	2.98	0.84	0.17	102	74.85	6.5	1.54E-01	1.75	15
Y-Well & TCLP	29865	476	39	116.38	2.98	0.84	0.17	430	0.00	6.5	1.26E-01	1.25	16
Y-Well & Infil	29865	476	7.9	116.38	14.73	0.84	0.46	430	0.00	6.5	1.20E-01	1.15	17
X-Well & Area	121406	476	7.9	116.38	14.73	0.84	0.17	102	127.63	6.5	8.87E-02	0.59	18
Wst. Conc & Z-Well	29865	476	7.9	500	63.29	0.84	0.17	430	90.08	1.3	7.95E-02	0.42	19
Wst. Vo & Z-Well	29865	1842.85	7.9	116.38	14.73	0.84	0.17	430	90.08	1.3	7.36E-02	0.32	20
TCLP & Infil	29865	476	39	116.38	2.98	0.84	0.46	430	90.08	6.5	6.97E-02	0.25	21
Y-Well & Area	121406	476	7.9	116.38	14.73	0.84	0.17	430	0.00	6.5	5.14E-02	-0.08	22
Y-Well & Z-Well	29865	476	7.9	116.38	14.73	0.84	0.17	430	0.00	1.3	4.99E-02	-0.11	23
TCLP & Area	121406	476	39	116.38	2.98	0.84	0.17	430	140.38	6.5	4.41E-02	-0.21	24
Infil & Area	121406	476	7.9	116.38	14.73	0.84	0.46	430	140.38	6.5	4.03E-02	-0.28	25
Infil & Z-Well	29865	476	7.9	116.38	14.73	0.84	0.46	430	90.08	1.3	2.66E-02	-0.52	26
TCLP & Z-Well	29865	476	39	116.38	2.98	0.84	0.17	430	90.08	1.3	2.31E-02	-0.59	27
Area & Z-Well	121406	476	7.9	116.38	14.73	0.84	0.17	430	140.38	1.3	1.84E-02	-0.67	28

* Relative concentration is equal to (Well Conc. - Basecase Conc)/Basecase Conc.

Table C.13 Sensitivity Analysis Hydrotreating On-site Landfill Scenario/ Benzene (TCLP=TC regulatory level)

Two Parameters at High End	Area (m ²)	Wst. Vol (m ³)	TCLP (mg/L)	Wst Conc (mg/kg)	Cw / Cl (L/kg)	Wst. Den (g/cm ³)	Infil (m/yr)	Y- Well (m)	Z-Well (m)	Maximum 9-year Avg. Conc. (mg/L)	Relative Conc. *	Rank
Base Case	29865	476	0.5	116.38	232.8	0.84	0.17	90.08	6.5	2.54E-02		
X-Well & Infil	29865	476	0.5	116.38	232.8	0.84	0.46	74.85	6.5	1.20E-01	3.71	1
X-Well & Y- Well	29865	476	0.5	116.38	232.8	0.84	0.17	0.00	6.5	9.25E-02	2.64	2
Wst. Conc. & X-Well	29865	476	0.5	500	1000.0	0.84	0.17	74.85	6.5	8.72E-02	2.43	3
Wst. Vol & X-Well	29865	1842.85	0.5	116.38	232.8	0.84	0.17	74.85	6.5	8.62E-02	2.39	4
Wst. Conc & Area	121406	476	0.5	500	1000.0	0.84	0.17	140.38	6.5	8.50E-02	2.35	5
Wst. Conc & Infil	29865	476	0.5	500	1000.0	0.84	0.46	90.08	6.5	8.32E-02	2.28	6
Wst. Vol & Area	121406	1842.85	0.5	116.38	232.8	0.84	0.17	140.38	6.5	8.16E-02	2.21	7
Wst. Vol & Infil	29865	1842.85	0.5	116.38	232.8	0.84	0.46	90.08	6.5	8.15E-02	2.21	8
Y-Well & Infil	29865	476	0.5	116.38	232.8	0.84	0.46	0.00	6.5	8.08E-02	2.18	9
Wst. Conc. & Y- Well	29865	476	0.5	500	1000.0	0.84	0.17	0.00	6.5	7.91E-02	2.11	10
Wst. Vol & Y- Well	29865	1842.85	0.5	116.38	232.8	0.84	0.17	0.00	6.5	7.80E-02	2.07	11
X-Well & Area	121406	476	0.5	116.38	232.8	0.84	0.17	127.63	6.5	7.27E-02	1.86	12
X-Well & Z-Well	29865	476	0.5	116.38	232.8	0.84	0.17	74.85	1.3	6.86E-02	1.70	13
Y-Well & Area	121406	476	0.5	116.38	232.8	0.84	0.17	0.00	6.5	4.33E-02	0.71	14
Wst. Vol & Wst Conc	29865	1842.85	0.5	500	1000.0	0.84	0.17	90.08	6.5	4.04E-02	0.59	15
Infil & Area	121406	476	0.5	116.38	232.8	0.84	0.46	140.38	6.5	3.83E-02	0.51	16
Y-Well & Z-Well	29865	476	0.5	116.38	232.8	0.84	0.17	0.00	1.3	2.24E-02	-0.12	17
Infil & Z-Well	29865	476	0.5	116.38	232.8	0.84	0.46	90.08	1.3	1.78E-02	-0.30	18
Area & Z-Well	121406	476	0.5	116.38	232.8	0.84	0.17	140.38	1.3	1.54E-02	-0.39	19
Wst. Conc & Z-Well	29865	476	0.5	500	1000.0	0.84	0.17	90.08	1.3	1.44E-02	-0.43	20
Wst. Vo & Z-Well	29865	1842.85	0.5	116.38	232.8	0.84	0.17	90.08	1.3	1.42E-02	-0.44	21

* Relative concentration is equal to (Well Conc. - Basecase Conc)/Basecase Conc.

Table C.14 Sensitivity Analysis Hydrotreating Off-site Landfill Scenario, Benzene

Two Parameters at High End	Area (m ²)	Depth (m)	Wst. Vol (m ³)	TCLP (mg/L)	Wst Conc (mg/kg)	Cw / Cl (L/kg)	Wst. Den (g/cm ³)	Infil (m/yr)	X-well (m)	Y- Well (m)	Z-Well (m)	Maximum 9-year Avg. Conc. (mg/L)	Relative Conc. *	Rank
Base Case	2020	2.6	476	7.9	116.38	14.73	0.84	0.17	430	52.84	6.5	3.96E-02		
Y-Well & TCLP	2020	2.6	476	39	116.38	2.98	0.84	0.17	430	0.00	6.5	3.38E-01	7.54	1
Y-Well & Infil	2020	2.6	476	7.9	116.38	14.73	0.84	0.46	430	0.00	6.5	3.00E-01	6.59	2
X-Well & Y- Well	2020	2.6	476	7.9	116.38	14.73	0.84	0.17	102	0.00	6.5	2.79E-01	6.06	3
Wst. Conc. & Y- Well	2020	2.6	476	7.9	500	63.29	0.84	0.17	430	0.00	6.5	2.39E-01	5.04	4
Wst. Vol & Y- Well	2020	2.6	1842.9	7.9	116.38	14.73	0.84	0.17	430	0.00	6.5	2.37E-01	5.00	5
X-Well & Infil	2020	2.6	476	7.9	116.38	14.73	0.84	0.46	102	34.38	6.5	2.02E-01	4.12	6
Wst. Conc & TCLP	2020	2.6	476	39	500	12.82	0.84	0.17	430	52.84	6.5	1.84E-01	3.66	7
X-Well & TCLP	2020	2.6	476	39	116.38	2.98	0.84	0.17	102	34.38	6.5	1.83E-01	3.63	8
Wst. Vol & TCLP	2020	2.6	1842.9	39	116.38	2.98	0.84	0.17	430	52.84	6.5	1.76E-01	3.46	9
Wst. Conc & Area	162000	2.6	476	7.9	500	63.29	0.84	0.17	430	155.71	6.5	1.63E-01	3.13	10
Wst. Vol & Area	162000	2.6	1842.9	7.9	116.38	14.73	0.84	0.17	430	155.71	6.5	1.47E-01	2.72	11
X-Well & Z-Well	2020	2.6	476	7.9	116.38	14.73	0.84	0.17	102	34.38	1.3	1.33E-01	2.37	12
Wst. Conc & Infil	2020	2.6	476	7.9	500	63.29	0.84	0.46	430	52.84	6.5	1.31E-01	2.32	13
Wst. Vol & Infil	2020	2.6	1842.9	7.9	116.38	14.73	0.84	0.46	430	52.84	6.5	1.28E-01	2.24	14
Wst. Conc. & X-Well	2020	2.6	476	7.9	500	63.29	0.84	0.17	102	34.38	6.5	1.21E-01	2.06	15
Wst. Vol & X-Well	2020	2.6	1842.9	7.9	116.38	14.73	0.84	0.17	102	34.38	6.5	1.21E-01	2.06	16
TCLP & Infil	2020	2.6	476	39	116.38	2.98	0.84	0.46	430	52.84	6.5	1.05E-01	1.65	17
Y-Well & Z-Well	2020	2.6	476	7.9	116.38	14.73	0.84	0.17	430	0.00	1.3	7.96E-02	1.01	18
X-Well & Area	162000	2.6	476	7.9	116.38	14.73	0.84	0.17	102	143.51	6.5	7.27E-02	0.84	19
Wst. Vol & Wst Conc	2020	2.6	1842.9	7.9	500	63.29	0.84	0.17	430	52.84	6.5	5.97E-02	0.51	20
Y-Well & Area	162000	2.6	476	7.9	116.38	14.73	0.84	0.17	430	0.00	6.5	4.17E-02	0.05	21
TCLP & Area	162000	2.6	476	39	116.38	2.98	0.84	0.17	430	155.71	6.5	3.84E-02	-0.03	22
Infil & Area	162000	2.6	476	7.9	116.38	14.73	0.84	0.46	430	155.71	6.5	3.30E-02	-0.17	23
TCLP & Z-Well	2020	2.6	476	39	116.38	2.98	0.84	0.17	430	52.84	1.3	3.24E-02	-0.18	24
Infil & Z-Well	2020	2.6	476	7.9	116.38	14.73	0.84	0.46	430	52.84	1.3	3.00E-02	-0.24	25
Wst. Conc & Z-Well	2020	2.6	476	7.9	500	63.29	0.84	0.17	430	52.84	1.3	2.30E-02	-0.42	26
Wst. Vo & Z-Well	2020	2.6	1842.9	7.9	116.38	14.73	0.84	0.17	430	52.84	1.3	2.28E-02	-0.42	27
Area & Z-Well	162000	2.6	476	7.9	116.38	14.73	0.84	0.17	430	155.71	1.3	1.64E-02	-0.59	28

* Relative concentration is equal to (Well Conc. - Basecase Conc.)/Basecase Conc.

Table C.15 Sensitivity Analysis Hydrotreating Off-site Landfill Scenario, Benzene (TCLP=TC Regulatory Level)

Two Parameters at High End	Area (m ²)	Wst. Vol (m ³)	TCLP (mg/L)	Wst Conc (mg/kg)	Cw / Cl (L/kg)	Wst. Den (g/cm ³)	Infil (m/yr)	X-well (m)	Y- Well (m)	Z-Well (m)	Maximum 9-year Avg. Conc. (mg/L)	Relative Conc. *	Rank
Base Case	2020	476	0.5	116.38	232.76	0.84	0.17	430	52.84	6.5	4.05E-03		
Wst. Conc & Area	162000	476	0.5	500	1000.00	0.84	0.17	430	155.71	6.5	8.87E-02	20.89	1
Wst. Vol & Area	162000	1842.9	0.5	116.38	232.76	0.84	0.17	430	155.71	6.5	8.45E-02	19.86	2
X-Well & Area	162000	476	0.5	116.38	232.76	0.84	0.17	102	143.51	6.5	6.39E-02	14.77	3
Y-Well & Infil	2020	476	0.5	116.38	232.76	0.84	0.46	430	0.00	6.5	4.14E-02	9.22	4
Y-Well & Area	162000	476	0.5	116.38	232.76	0.84	0.17	430	0.00	6.5	3.74E-02	8.23	5
Infil & Area	162000	476	0.5	116.38	232.76	0.84	0.46	430	155.71	6.5	3.18E-02	6.85	6
X-Well & Y- Well	2020	476	0.5	116.38	232.76	0.84	0.17	102	0.00	6.5	2.73E-02	5.74	7
X-Well & Infil	2020	476	0.5	116.38	232.76	0.84	0.46	102	34.38	6.5	2.63E-02	5.48	8
Wst. Vol & Y- Well	2020	1842.9	0.5	116.38	232.76	0.84	0.17	430	0.00	6.5	1.72E-02	3.25	9
Wst. Conc. & Y- Well	2020	476	0.5	500	1000.00	0.84	0.17	430	0.00	6.5	1.72E-02	3.24	10
Area & Z-Well	162000	476	0.5	116.38	232.76	0.84	0.17	430	155.71	1.3	1.46E-02	2.59	11
X-Well & Z-Well	2020	476	0.5	116.38	232.76	0.84	0.17	102	34.38	1.3	1.30E-02	2.21	12
Wst. Vol & Infil	2020	1842.9	0.5	116.38	232.76	0.84	0.46	430	52.84	6.5	1.07E-02	1.64	13
Wst. Conc & Infil	2020	476	0.5	500	1000.00	0.84	0.46	430	52.84	6.5	1.05E-02	1.60	14
Wst. Vol & X-Well	2020	1842.9	0.5	116.38	232.76	0.84	0.17	102	34.38	6.5	8.61E-03	1.12	15
Wst. Conc. & X-Well	2020	476	0.5	500	1000.00	0.84	0.17	102	34.38	6.5	8.60E-03	1.12	16
Y-Well & Z-Well	2020	476	0.5	116.38	232.76	0.84	0.17	430	0.00	1.3	8.05E-03	0.99	17
Infil & Z-Well	2020	476	0.5	116.38	232.76	0.84	0.46	430	52.84	1.3	4.15E-03	0.02	18
Wst. Vol & Wst Conc	2020	1842.9	0.5	500	1000.00	0.84	0.17	430	52.84	6.5	3.97E-03	-0.02	19
Wst. Vo & Z-Well	2020	1842.9	0.5	116.38	232.76	0.84	0.17	430	52.84	1.3	1.66E-03	-0.59	20
Wst. Conc & Z-Well	2020	476	0.5	500	1000.00	0.84	0.17	430	52.84	1.3	1.65E-03	-0.59	21

* Relative concentration is equal to (Well Conc. - Basecase Conc.)/Basecase Conc.

Table C.16 Parameter Distributions for Hydrotreating Catalyst / Arsenic

Parameter	Onsite		Offsite	
	Median ¹	High-End ²	Median ¹	High-End ²
Area (m ²)	29865	121406	2020	162000
Wst. Quantity (MT)	400	1843	400	1843
TCLP (mg/L)	1.1	4.9	1.1	4.9
Wst Conc (mg/kg)	393.3	1600	393.3	1600
Infil (m/yr)	0.17	0.46	0.17	0.46
X-well (m)	430	102	430	102
Y- Well (m)	*	0	*	0
Z-Well (m)	6.5	1.3	6.5	1.3

* The median values of Y-well is taken as 1/2 the plume width and is therefore a function of X-well and landfill area.

1. Mean value in the case of waste and leachate concentration.
2. High-End refers to the 10th % for X-well, maximum value for waste and leachate concentrations and 90th % for all other parameters

Table C.17 Sensitivity Analysis Hydrotreating On-site Landfill Scenario/ Arsenic

Two Parameters at High End	Area (m ²)	Wst. Vol (m ³)	TCLP (mg/L)	Wst Conc (mg/kg)	Cw / Cl (L/kg)	Wst. Den (g/cm ³)	Infil (m/yr)	X-well (m)	Y- Well (m)	Z-Well (m)	Maximum 9-year Avg. Conc. (mg/L)	Relative Conc. *	Rank
Base Case	29865	476	1.1	393.3	357.55	0.84	0.17	430	90.08	6.5	1.36E-03		
Wst. Vol & Wst Conc	29865	1842.85	1.1	1600	1454.55	0.84	0.17	430	90.08	6.5	1.90E-02	12.96	1
Wst. Conc. & X-Well	29865	476	1.1	1600	1454.55	0.84	0.17	102	74.85	6.5	1.62E-02	10.89	2
Wst. Vol & X-Well	29865	1842.85	1.1	393.3	357.55	0.84	0.17	102	74.85	6.5	1.54E-02	10.33	3
Wst. Conc. & Y- Well	29865	476	1.1	1600	1454.55	0.84	0.17	430	0.00	6.5	1.21E-02	7.88	4
Wst. Vol & Y- Well	29865	1842.85	1.1	393.3	357.55	0.84	0.17	430	0.00	6.5	1.15E-02	7.45	5
Wst. Conc. & Infil	29865	476	1.1	1600	1454.55	0.84	0.46	430	90.08	6.5	7.28E-03	4.35	6
Wst. Vol & Infil	29865	1842.85	1.1	393.3	357.55	0.84	0.46	430	90.08	6.5	6.93E-03	4.09	7
X-Well & Infil	29865	476	1.1	393.3	357.55	0.84	0.46	102	74.85	6.5	6.73E-03	3.94	8
X-Well & Y- Well	29865	476	1.1	393.3	357.55	0.84	0.17	102	0.00	6.5	5.88E-03	3.31	9
Wst. Conc & TCLP	29865	476	4.9	1600	326.53	0.84	0.17	430	90.08	6.5	5.55E-03	3.07	10
Wst. Vol & TCLP	29865	1842.85	4.9	393.3	80.27	0.84	0.17	430	90.08	6.5	5.28E-03	2.88	11
X-Well & Z-Well	29865	476	1.1	393.3	357.55	0.84	0.17	102	74.85	1.3	4.53E-03	2.33	12
Wst. Conc & Area	121406	476	1.1	1600	1454.55	0.84	0.17	430	140.38	6.5	4.12E-03	2.02	13
X-Well & TCLP	29865	476	4.9	393.3	80.27	0.84	0.17	102	74.85	6.5	4.05E-03	1.98	14
Wst. Vol & Area	121406	1842.85	1.1	393.3	357.55	0.84	0.17	430	140.38	6.5	3.92E-03	1.88	15
Y-Well & Infil	29865	476	1.1	393.3	357.55	0.84	0.46	430	0.00	6.5	3.16E-03	1.32	16
Y-Well & TCLP	29865	476	4.9	393.3	80.27	0.84	0.17	430	0.00	6.5	3.01E-03	1.21	17
Wst. Conc & Z-Well	29865	476	1.1	1600	1454.55	0.84	0.17	430	90.08	1.3	2.25E-03	0.65	18
X-Well & Area	121406	476	1.1	393.3	357.55	0.84	0.17	102	127.63	6.5	2.19E-03	0.61	19
Wst. Vo & Z-Well	29865	1842.85	1.1	393.3	357.55	0.84	0.17	430	90.08	1.3	2.14E-03	0.57	20
TCLP & Infil	29865	476	4.9	393.3	80.27	0.84	0.46	430	90.08	6.5	1.80E-03	0.32	21
Y-Well & Z-Well	29865	476	1.1	393.3	357.55	0.84	0.17	430	0.00	1.3	1.23E-03	-0.09	22
Y-Well & Area	121406	476	1.1	393.3	357.55	0.84	0.17	430	0.00	6.5	1.18E-03	-0.13	23
Infil & Area	121406	476	1.1	393.3	357.55	0.84	0.46	430	140.38	6.5	1.08E-03	-0.21	24
TCLP & Area	121406	476	4.9	393.3	80.27	0.84	0.17	430	140.38	6.5	1.01E-03	-0.26	25
Infil & Z-Well	29865	476	1.1	393.3	357.55	0.84	0.46	430	90.08	1.3	7.15E-04	-0.48	26
TCLP & Z-Well	29865	476	4.9	393.3	80.27	0.84	0.17	430	90.08	1.3	5.60E-04	-0.59	27
Area & Z-Well	121406	476	1.1	393.3	357.55	0.84	0.17	430	140.38	1.3	4.32E-04	-0.68	28

* Relative concentration is equal to (Well Conc. - Basecase Conc)/Basecase Conc.